

Abstract

The object of the present invention is to provide a diffusion preventing film capable of inhibiting diffusion of Cu into an insulator film when Cu is used as a wiring material. This objective
5 is attained by forming the diffusion preventing film from a crystalline WCN film. The WCN film, when subjected to X-ray diffraction, shows peaks at a first position between 36° to 38° and at a second position between 42° to 44°. The half-width of the peak at the first position is 3.2° or less, and the half-width of the peak
10 at the second position is 2.6° or less. Since the WCN film has satisfactory coverage, it can form a thick barrier film in a concave with a high aspect ratio.

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